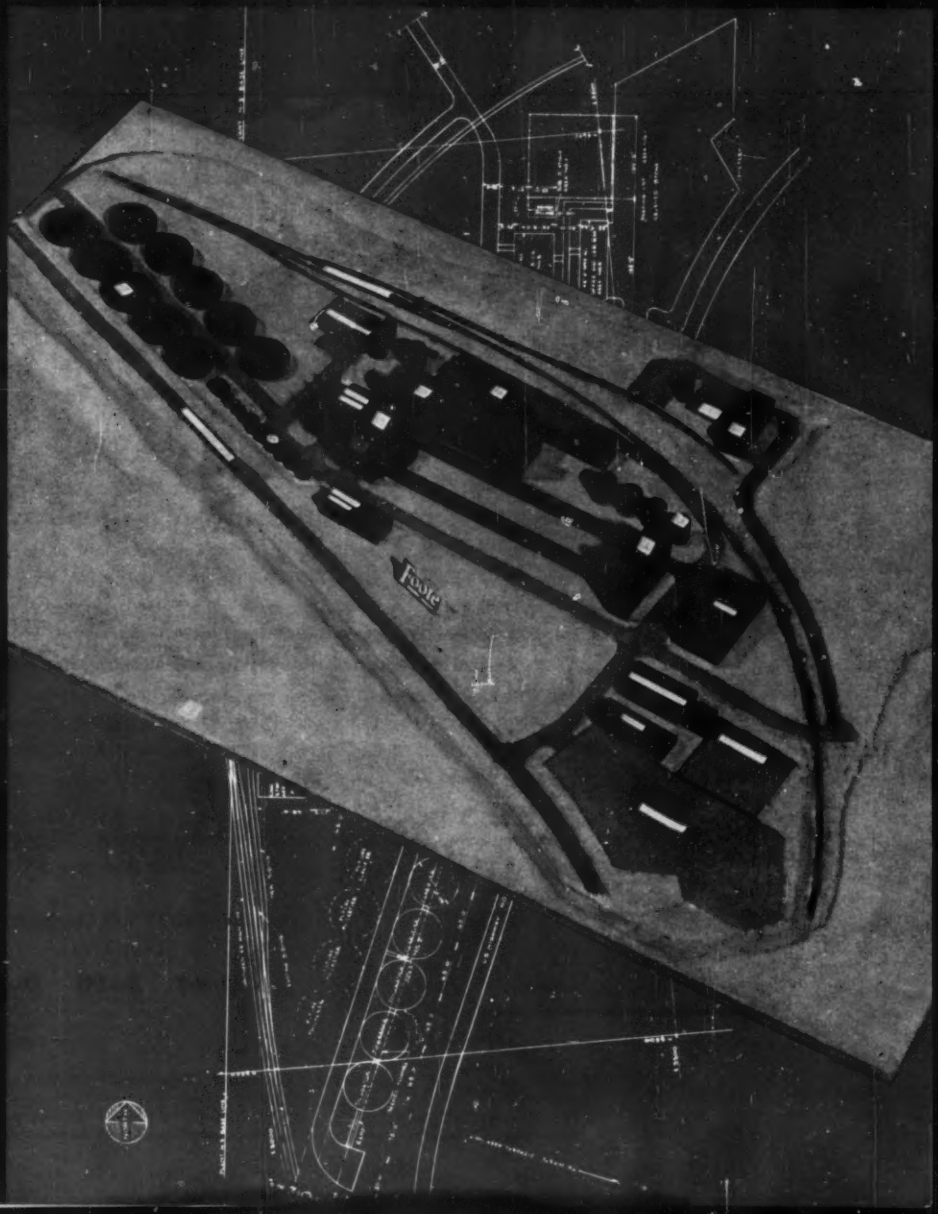
The Spokesman



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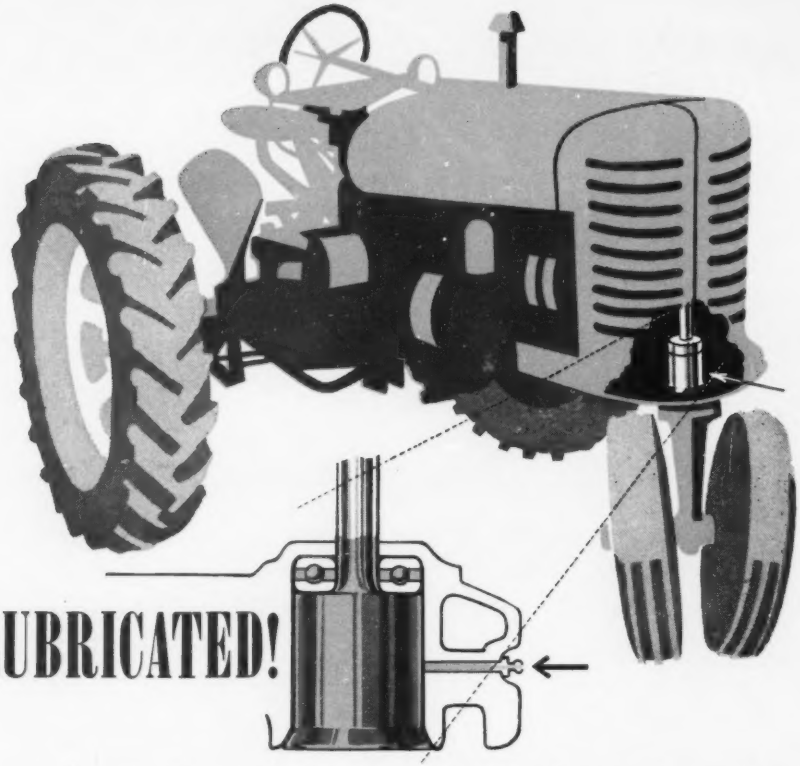

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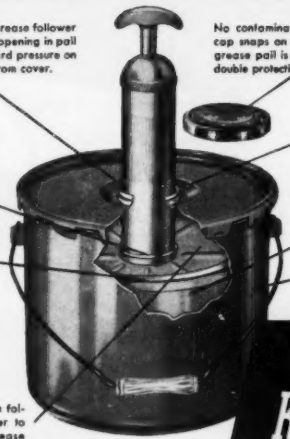

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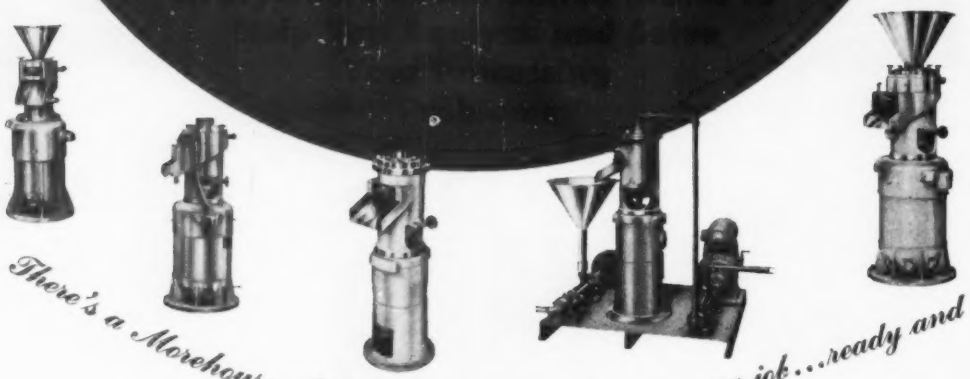

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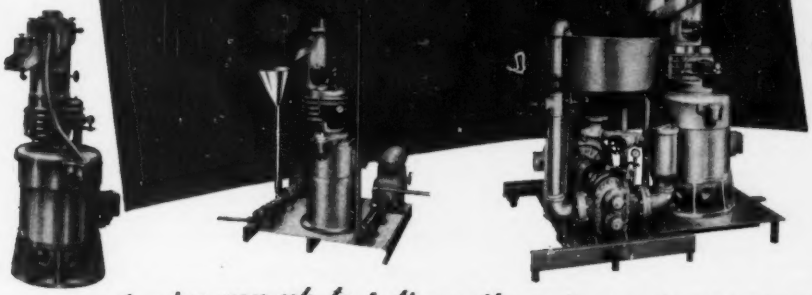

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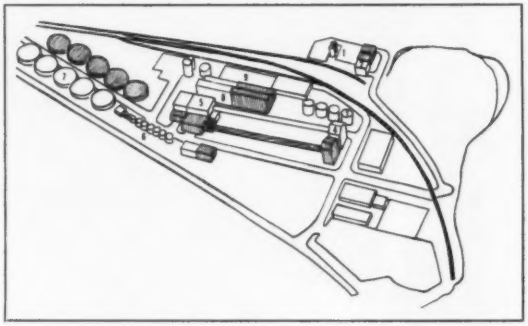
ABOUT THE COVER



This month's cover depicts a model of the world's largest lithium processing plant now being built for Foote Mineral Company by Blaw-Knox Construction Company, at Sunbright, Va. This model was used as a visual aid in planning of plant grading, road drainage and functional arrangement of buildings with respect to material flow, accessibility, and utility service distribution.

The Sunbright operation will cover about 160 acres and is the major project in a $4,000,000 lithium expansion program. This site includes large deposits of chemical grade limestone, a major process raw material. Foote's spodumene (lithium ore) mines at Kings Mountain, N. C., as pictured on the June 1951 issue of "The Spokesman", will supply the lithium raw material for this plant.

Scheduled for completion by mid-1953, this plant will increase U. S. industrial capacity for lithium chemicals by over 100 per cent.

The numbers of the model indicate sequence of process flow. Red represents immediate plant construction. Blue (shaded) represents future plant expansion.

President's page

by George E. Merkle, President, N L G I

LIBERTY

It was after the Franco-Prussian War that the French people presented the American people the Statue of Liberty which is located on Bedloe's Island. This statue has stood as a symbol of freedom for more than sixty years.

The early settlers of our country left their mother country so that they might enjoy certain freedoms of speech, thought and actions which they felt were too restricted in their country. This set the theme which we have believed to be our most cherished possession. We have followed this belief all through the years in many respects, particularly as regards our speech and thought but in more recent years certain groups have been permitted, and in fact protected in their efforts, to deprive a large sector of our population of its rights as regards its actions.

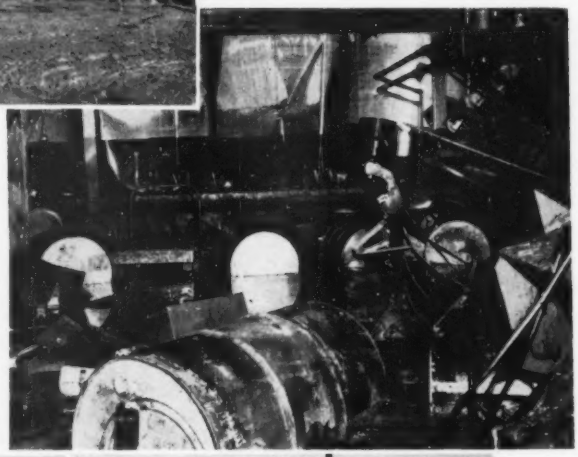
So long as any citizen of our country conducts his activities in a legal manner he should be free to conduct his affairs unhampered. This sort of freedom has been denied many of our people in recent years and they have had no recourse. A man may be in business in which he has his investment and many fixed overhead costs and a full year's taxes to pay and yet for one reason or another, through no fault of his, he can use his facilities only a portion of a year. In some cases this means a financial failure. Only concerns with large reserves can survive. Innocent individuals willing to work often find that their freedom and liberty have been taken from them and they must conform to the wishes of others who have no legal rights to dictate the activities of such individuals. This condition can hardly be called liberty except for the few who have taken the liberty.

In times of war we expect restrictions, sacrifices and inconveniences which some feel are encroachments on our liberties. If these restrictions are held at proper levels no one is justified in complaining about loss of liberty, but there is just cause for complaint when they are unjustly severe and create inequities. The injustice of some so-called "Freezes" is a notable example of abuse of our freedom. "Freezes" do not apply equally to all regarding prices based on increased costs nor do all wage earners fare equally under wage and salary regulations.

If we strive for and vote for whatever is best for the general public we will benefit in the end. Let us try to recover our liberty.

Inter-State

HERE IS WHAT C. A. Shepard, Inter-State's president, saw when the flood receded.



INSIDE (right) it was a scrambled silt-covered mess.

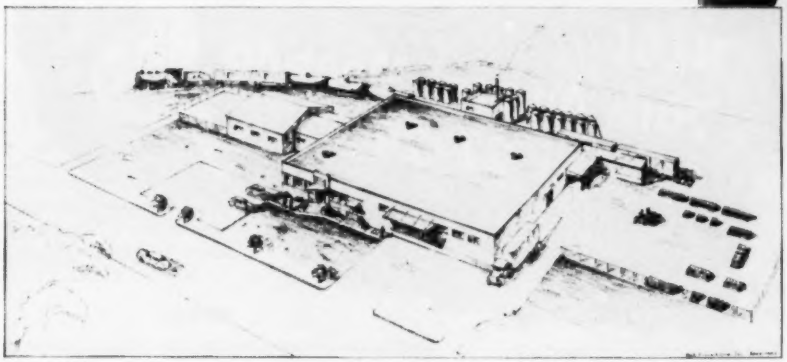
PART OF THE WALL (below) and roof were gone. Notice the high water mark apparent through the upper part of the lettering across the front of the building.

SOME IDEA of the height and power of the flood at the rear of the plant is shown.

WHAT FEW TANKS remain are shown here.

Oil Begins Construction On A $300,000 Plant

Building Will Be Located at New Industrial Site Being Opened in Kansas City, Kansas. Inter-State Oil Company Was Forced by Flood Waters of July 1951 From Its Home Plant.



PRESIDENT C. A. (Van) SHEPARD breaks ground for Inter-State's "plant of their dreams," shown in the above sketch. The company has been operating at near normal capacity by drawing on warehouses in neighboring cities and through cooperation of other oil companies.

IT was Friday the 13th, black Friday they called it, when flood waters roared into Kansas City, creating the worst disaster it had ever known. This was during the summer of 1951 and 28 feet of silt-laden yellow water swirled over the plant of the Inter-State Oil Company.

Beneath those 28 feet of flood waters lay the result of 65 years experience and toil building the reportedly oldest independent oil company west of the Mississippi. A complete lube plant, equipment and records were washing down the river to the tune of something like $350,000.

Flood damage was not new to Inter-State. It had existed through the floods of 1903, 1904 and 1908; but nothing like this one resulting in damage absolute and complete. Little could be salvaged, not even adding machines or delicate testing equipment could be reclaimed. Flood insurance was not available, making the loss about as complete as could possibly be imagined.

That was on Friday. On the following Monday Inter-State bounced back opening for business in temporary quarters and was making limited shipments that day. They lost only one business day. With the plant still under water they pluckily believed it could be renovated and they would be back in business at the old stand within a short period of time.

When the waters did recede and they were able to get to see their buildings, a bulldozer was called in, and with a high loader a path was cleared through six feet of mud, slime and muck. When the pressure of this accumulated debris was cleared from the door it burst open and an oozing mass of river mud descended on them. Further inspection disclosed the roof caved in in several places, sections of brick wall were gone. What tanks were left were crushed and equipment outside the tanks had washed away. That was the outside picture; inside was a shambles. It would be better to rebuild.

Since then, Inter-State has been operating in temporary headquarters. Just recently they announced a new $300,000 plant located high above possible future flood water on a 23-acre tract. Curiously the new location was prepared through the removal of a high dirt bluff which was carted away to repair river dikes damaged by the flood. The new plant will contain an estimated 25,000 square feet of floor space. A pumphouse and barrel reconditioning plant will be erected in addition.

With the new building Inter-State expects to double production. Congratulations to a flood victim that wouldn't quit. It's good to know its 65-year experience will continue to be an asset to the petroleum industry.

ADDRESS

Dr. Neal Bowman, National Association of Manufacturers

Dr. Bowman has had a rich and varied background as an educator, author, lecturer and sales psychologist, as recorded in his biographical sketch in WHO'S WHO IN AMERICA.

His early experience as shipping foreman, retail store manager, trade paper editor, and advertising and publicity director, has increased his appreciation of the importance of human relations.

After service in World War 1, he obtained a bachelor's degree from Temple University. He later obtained a master's degree from the University of Pennsylvania, and a doctor's degree from Rutgers University.

For 17 years he was Professor of Marketing in the School of Business and Public Administration at Temple University. He has written three books on advertising and selling and has recently published a book on the principles and practices of public speaking.

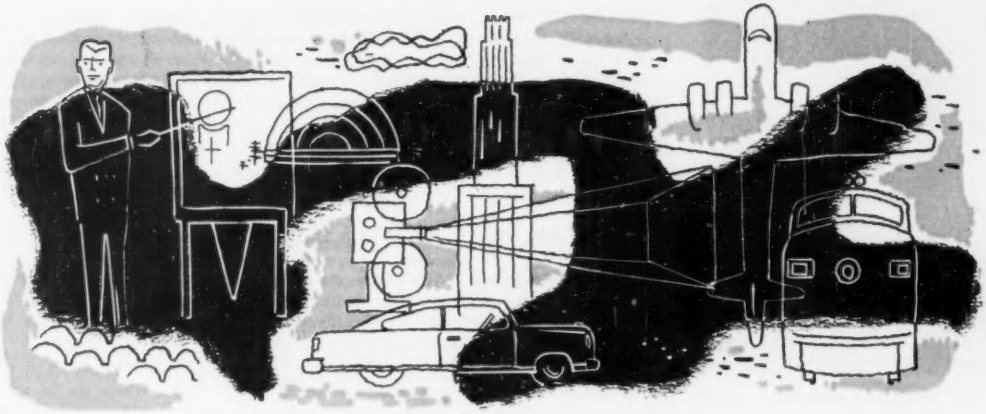
Dr. Bowman has been a staff speaker for the N. A. M. since early 1944 and has traveled from coast to coast many times, speaking to hundreds of audiences.

NEAL BOWMAN

ROLLER BEARING GREASE LUBRICANTS FOR RAILWAY CAR JOURNALS

H. T. Rockwell, New York Central System

H. T. Rockwell, Assistant Engineer, Engineering Division of Equipment Department, New York Central System, started his career with that company on graduation from high school in 1923, in The Beech Grove, Indiana Locomotive



Shop. After apprenticeship and leave of absence he was graduated with a B. S. degree in Mechanical Engineering from Georgia School of Technology in 1933. He is a member of the Briarean Society and Pi Tau Sigma. Continuing with the New York Central System, in 1936 he joined the Engineering Department and since 1948 has been a member of the Committee on Lubrication of Cars and Locomotives of the Association of American Railroads, Mechanical Division.

Abstract

When the first high speed Diesel-powered trains began rolling up miles in commercial operation during the middle thirties, railway journal bearing lubrication entered a new era. Before that time, the requirements were anything but critical, but as speeds and loads, and the use of roller bearings, increased, so did the complications of proper lubrication.

Today, the railroads are seeking roller bearing greases which are suitable in a single grade for all of several makes of roller bearings, which will not congeal at low temperatures yet will not become so fluid as to leak out at high temperatures, and which will provide protection against corrosion and wear without undue deterioration, for periods of one to three years, or mileages of 350,000 to 600,000. It is quite an order, but the cooperative effort of the railroad and grease industries is gradually solving the problem.

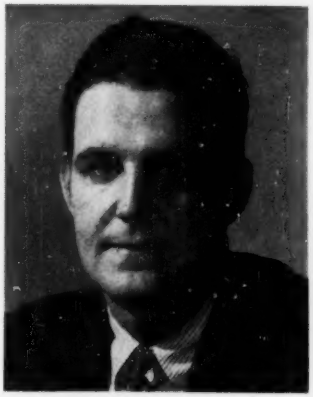
LITHIUM—TODAY AND TOMORROW

H. C. Meyer, Jr., Foote Mineral Company
Co-Author: J. Fentress, Foote Mineral Company

H. C. Meyer, Jr., is Manager of Chemical Sales for Foote Mineral Company, covering a territory throughout the U. S. on chemicals, petroleum products, and allied fields. Mr. Meyer joined Foote in 1940, serving first in its chemical plant and later taking charge of research on lithium base greases. In this latter capacity he was instrumental in developing and merchandising lithium hydroxide for use in multi-purpose greases. Foote is licensee for the Earle patents covering production of lithium greases in the do-

H. T. ROCKWELL

H. C. MEYER, JR.



J. FENTRESS

PETER J. BAKER

N. T. JOYNER

L. C. BRUNSTRUM

mestic and foreign trade markets. There are currently 27 major U. S. oil companies now licensed to reproduce multi-purpose lithium greases.

James Fentress, formerly Research Assistant at Northwestern University, has now joined Foote Mineral Company as Sales Engineer. Mr. Fentress obtained his degree in Chemistry at Princeton University in 1944 and since that time has been closely identified with the Atomic Energy Commission and the Naval Bureau of Ships in Chemistry and Physics. In addition to his work at Northwestern he was associated with the University of Chicago and the Hanford Laboratories.

Mr. Fentress, a native of Winnetka, Ill., is a member of the Society of Sigma XI as well as both the Electrochemical and American Chemical Societies.

Abstract

In "Life" Magazine, and articles in the press, Lithium has been tied to hydrogen bombs, atom bombs, atomic power plants, and a host of secret uses. All, incidentally, officially unconfirmed. No headlines are needed to confirm the fact that industry has not been getting the lithium it requires.

To answer such questions as: Is it physically and economically possible to produce enough lithium for established commercial uses? — and, Where do the actual and hypothetical military uses fit into the picture? — the foundation of the lithium industry, raw material, chemical processing capacity and economics of the lithium market must be examined.

Although many lithium ores are known, only spodumene ($LiAl\ Si_2O_6$) holds promise of satisfying industry's greatly expanded demands for lithium. The mining and chemical processing of spodumene, while not complex physically or chemically, involves extremely large volumes of raw material. It requires more than 120 tons of raw ore to produce 1 ton of lithia.

Currently, the manufacturers of ceramics and glass, lubricating greases, aluminum products, humidity control systems and alkaline storage cells are all demanding lithium chemicals in quantities far larger than the present capacity of the lithium industry.

With increased chemical production capacity the only possible solution to the current lithium shortage, the world's largest lithium plant is now being erected at Sunbright, Va., with mid-1953 as the expected completion date. This expansion program will serve to bring the lithium market into balance in the near future.

A CONTINUOUS METHOD FOR THE MANUFACTURE OF LITHIUM GREASE

Peter J. Baker, The Girdler Corporation
Co-Author: N. T. Joyner, The Girdler Corporation

Peter J. Baker was born in Vienna. He attended the University of Tulsa, Oklahoma A. & M. and New York University where he received his B. S. degree in chemical engineering. He did university research work and was associated with Molded Latex Products, Inc., before joining the Votator Division of The Girdler Corporation in 1949. He is a chemical engineer engaged in pilot plant projects, process equipment development and in various studies pertinent to the Votator Division's operations in various fields.

Mr. Baker is a member of the American Chemical Society and the American Institute of Chemical Engineers.

N. T. Joyner was born in Columbia, S. C., and received his B. S. degree in chemistry at the Virginia Military Institute. He is a prominent figure in the glyceride oil field.

Mr. Joyner began his business career in 1929 with the Buckeye Cotton Oil Company, a subsidiary of Proctor & Gamble Company, and later transferred his activities to the parent organization. In 1932 he joined Lever Brothers Company, Cambridge, Mass., where he was assistant director of research. He became associated with The Girdler Corporation in 1951.

Mr. Joyner is a member of the American Chemical Society, the American Oil Chemists' Society and the Institute of Food Technologists.

Abstract

A process for the continuous production of lithium grease is described. A slurry is made from prepared lithium stearate and part of the oil. The slurry is rapidly heated to solution temperature in scraped surface heat transfer apparatus. The remainder of the oil is blended with the hot slurry and the conditions under which it is added and the temperature of the blended product are the critical variables in the process. The grease is cooled rapidly in scraped surface heat transfer apparatus and milled prior to packaging. The effects of temperature, agitation, and various oils on the yield and stability of the grease are evaluated. Advantages of the process are enumerated.

FLOW OF LUBRICATING GREASE BETWEEN PARALLEL PLANES

L. C. Brunstrum, Standard Oil Company (Indiana)
Co-Author: Dr. H. M. Grubb, Standard Oil Company (Indiana)

L. C. Brunstrum has been a member of the Standard Oil Company (Indiana) since his graduation from Armour Institute of Technology in 1929 and is currently a section leader in the Whiting Research Laboratories. He is a member of the American Chemical Society, Society of Rheology, and American Society of Lubrication Engineers.

H. M. Grubb has been a member of the Research Department of the Standard Oil Company (Indiana) since his graduation from Purdue University in 1938, where he received both B. S. and Ph. D. degrees. He is currently a group leader in charge of the Physics Analytical Research Group in the Whiting Research Laboratories and is a member of the American Chemical Society.

Abstract

The flow of lubricating grease betweel parallel planes has been studied by measuring apparent viscosity in circular capillaries and in rectangular capillaries. Within the shear rate range employed, the results are identical for perfectly smooth greases, but are different for fibrous greases. The apparent viscosities of fibrous greases are lower in the case of the rectangular capillaries. The difference increases with increasing fibre length of the grease and, to a lesser degree, with shear rate. This difference is attributed to the fact that in rectangular capillaries orientation of the fibres need take place in only one of the two planes parallel to the flow axis, whereas in the circular capillary orientation takes place in both planes.

ADDITIVES FOR GREASES

Dr. R. T. Macdonald, California Research Corporation
Co-Author: J. L. Dreher, California Research Corporation

R. T. Macdonald received his B. S. and Ph. D degrees from the University of California in 1928 and 1932. From 1932 to 1935 he was a Research Associate in Chemistry under Prof. G. N. Lewis.

Dr. Macdonald joined California Research Corporation in 1936 (it was then the Research and Development Department of Standard Oil Company of California).

He is a member of American Chemical Society, Alpha Chi Sigma, Sigma Xi, and Tau Beta Pi.

J. L. Dreher received his A. B. degree from UCLA in 1935. He was with General Petroleum Corporation in Los Angeles until 1943. He then worked in Metallurgical Laboratories (Atomic Bomb Project) at the University of Chicago until 1944.

Until 1945 he was with Du Pont in Richland, Washington. Mr. Dreher joined California Research Corporation in 1945, where he is a research chemist in the Grease Development Laboratory. He is a member of American Chemical Society and Alpha Chi Sigma.

Abstract

The article discusses the use of additives for greases which are needed to meet the lubrication requirements of modern machines. Although the additives used in greases are similar to those used in oils, such as gear lubricants, turbine oils, and motor oils, a higher concentration is usually required, and frequently the response is not the same.

H. M. GRUBB

R. T. MACDONALD

J. L. DREHER

E. R. BOOSER

A. E. BAKER

E. G. JACKSON

The three principal types of grease additives, rust inhibitors, extreme pressure agents, and oxidation inhibitors, are discussed in detail with respect to need, methods of evaluation, and the types of compounds which are effective. The results obtained through the use of these additives are largely dependent upon the type of the grease. For example, with extreme pressure agents, which are used in greases that are subjected to shock loading, three different load carrying values have been obtained through the addition of the same amount of an additive to a calcium-base grease, a lithium-base grease, and a Bentone grease. In addition, with oxidation inhibitors the response is dependent upon the refinement of the oil in the grease. In general, the higher the degree of refinement, the more resistant to oxidation is the grease after the addition of the oxidation inhibitor.

The other additives, fillers, coloring agents, additives to eliminate the separation of oil, and stringiness agents, are discussed in a general way.

PERFORMANCE OF SYNTHETIC GREASES

Dr. E. R. Booser, General Electric Company
Co-Authors: A. E. Baker, Jr., and Dr. E. G. Jackson, General Electric Company

E. Richard Booser received a Ph. D. degree from The Pennsylvania State College in 1949 following graduate studies in petroleum refining. Since that time he has ben engaged in work on various phases of lubrication at the Bearing and Lubricant Center of the Thomson Laboratory. He is chairman of the Lubrication Fundamentals Committee of the A. S. L. E. and a member of the A. C. S. and A. I. Ch. E.

A. E. Baker graduated from Northeastern University in 1940 with a B. S. in Chemical Engineering. Graduate work at Tufts College and Massachusetts Institute of Technology preceded entering the Air Force as a Staff Meteorologist in 1942. After four years in the service, he joined the Thomson Laboratory of the General Electric Co., as a leader of the Fuels and Lubricants Group concerned with application, development, and physical properties of lubricants. Mr. Baker is associated with several technical societies including the A. C. S., A. I. Ch. E., A. S. T. M., American Meteorlogical Society and the A. S. L. E., presently serving as a Material Director of the latter; and in 1952 he became a member of the Metal Working Lubricants Committee of the American Ordnance Association.

Earl G. Jackson received a B. S. degree from American International College and an M. A. degree from Clark University before going into the Navy in 1943. From 1946 to 1948 he worked for Merck and Company in its physical chemical research laboratory. In 1951 he received a Ph. D. from Rutgers University where he worked on the physical chemistry of polymeric soaps. Since then he has worked at the Bearing and Lubricant Center on physical chemical problems of bearing materials and lubrication. He is a member of A. C. S., A. A. A. S., N. Y. Academy of Sciences and Sigma Xi.

Abstract

Synthetic greases have been developed to fill a need created by engineering advances which produce increasingly severe service conditions. Standard laboratory and performance tests have shown that silicones provide the best high temperature stability and ball bearing life, but they must be applied with caution in gears and on sliding parts. Silicone-diester greases are outstanding for extreme low temperature operation. Diester products have excellent lubricity and are also useful at very low temperatures. Although cost considerations will dictate that petroleum oils be the base of most greases for some time to come, designers will be taking increasing advantage of the synthetics as their capabilities become more widely known.

PREPARATION AND PROPERTIES OF SILICA AEROGEL-THICKENED GREASES

E. C. Milberger, The Standard Oil Company (Ohio)
Co-Author: Miss L. J. Swatik, The Standard Oil Company (Ohio)

After graduating from Kansas City (Missouri) Junior College, Ernest C. Milberger receievd his A. B. and M. A. degrees from the University of Missouri. From 1942 to 1946, he worked as a chemist in the Beacon Laboratories of The

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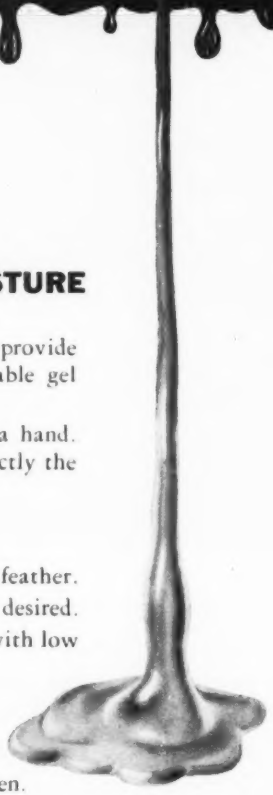

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Texas Company in the field of analytical research and hydrocarbon synthesis. Since 1946 he has been a member of the Chemical and Physical Research Division of The Standard Oil Company (Ohio) in Cleveland, working on the liquid thermal diffusion process and on grease development. During this interval he has pursued a part-time course of study at Western Reserve University leading toward a Ph. D. degree.

Miss Lorraine J. Swatik received her B. A. degree in chemistry from Ohio Wesleyan University in 1949. Since that year she has been a member of the Chemical and Physical Research Division of the Standard Oil Company (Ohio).

Abstract

Silica aerogel-thickened greases are thickened lubricants wherein a finely divided silica is used as the gelling agent instead of soap. The silica content is non-abrasive as shown by laboratory tests and by field performance. These greases are characterized by extreme ease and reproducibility of preparation at ordinary temperatures and with conventional mixing equipment. When properly compounded with suitable additives, they are shown to possess water resistance, consistency stability at high temperature and to working, excellent oxidation resistance, and low bleeding tendencies. Their exceptionally flat temperature versus consistency curve frequently permits the use of softer grades than would be required with soap-type greases. To date, greases of this type have been successfully used in many service applications and show promise for multi-purpose duty.

USAF GREASE DEVELOPMENT AND LUBRICATION PROBLEMS

Bernard Rubin, Wright Air Development Center
Co-Author: J. C. Mosteller, Wright Air Development Center

Bernard Rubin was born in Brooklyn, New York, in 1917. He graduated from City College of New York, with a B. S. in chemistry in 1940. A graduate of Ohio State University, with an M. S. in chemical engineering in 1950, he worked for one year in the field of dye chemistry. In 1942 he entered the Air Force as a civilian instructor in ground maintenance of aircraft. After the war he was transferred to the Materials Laboratory, Directorate of Research, WADC, at Wright-Patterson Air Force Base, Ohio, as chemist in the Petroleum Products Branch. Subsequently Mr. Rubin became Section Chief in charge of grease development and evaluation programs.

He is a member of A. C. S. and A. S. L. E. and is active in A. S. T. M. and C. R. C. projects and works on government committees dealing with lubricants.

Abstract

Investigation of the USAF to satisfy the need for an extreme low temperature grease has led to the commercial development of a diester type grease described by the recently issued Specification MIL—G—7421 (USAF). This grease is currently being used in several applications where operating problems in the —65° F. to —100° F. have been encountered.

Development of high temperature greases for operation in the 400° F. to 500° F. range has been making great strides forward. Thickening agents such as the copper phthalocyanines and other nitrogen compounds are stable at the high temperatures and are available commercially or not difficult to prepare at reasonable cost. The greatest shortcoming today, hampering the full exploitation of these new thickening agents, is the lack of suitable very wide range oils (—100° F. to 500° F.) and oils for extremely high temperature greases.

Several special lubrication problems have been successfully answered. Silicone-diester oil blend lithium soap greases appear to have solved the rubber-to-metal lubrication problems of pneumatic system components. Lubricants for ground equipment handling strong oxidizing acids have been developed. Lubrication of high-speed instruments, however, poses a problem requiring careful definition of variables.

X-RAY DIFFRACTION STUDIES OF ORIENTED SOAP STRUCTURES IN GREASE-LIKE SYSTEMS (N L G I Fellowship Report)

Dr. Marjorie J. Vold, Department of Chemistry, University of Southern California

Dr. M. J. Vo'd was born in Canada (1913) but grew up in California, attending the University of California at Berkeley from 1930 to 1936. She received her B. S.

E. C. MILBERGER

MISS L. J. SWATIK

BERNARD RUBIN

DR. MARJORIE J. VOLD

in chemistry in 1934 and was awarded the University Medal as class valedictorian. Her Ph. D. work was in the field of reaction kinetics and was carried out under the direction of Dr. Axel R. Olson.

Dr. Robert D. Vold and Mrs. Vold have collaborated in their studies of the physical and colloidal chemistry of soap systems since 1937, first at Stanford in collaboration with Professor J. W. McBain and subsequently at the University of Southern California. Between them they have published over sixty papers dealing with various aspects of this topic including phase studies in oil and water systems, polymorphic transitions in solvent-free soaps, soap hydrates, differential thermal analysis, properties of soap solutions, structural studies by x-ray diffraction and electron microscopy, etc. Mrs. Vold gained some insight into the problems of the petroleum industry through a three-year period of employment in the research laboratories of the Union Oil Company (1943-46). She has held the N. L. G. I. fellowship during the academic year 1951-52.

It is not all work and no play with the Volds. Their major hobbies include three young children, high mountain vacations, photography and gardening.

Abstract

Now that it seems to have been established that the primary structure in a grease is a meshwork of more or less crystalline soap particles, it becomes pertinent to inquire how this concept can be exploited. Presumably individual particles cohere in some manner, and this cohesion provides resistance of the individual particles to orientation by flow. It was thought, therefore, that study of the development of non-random orientation of the soap crystallites in grease systems might provide information about the same structure which results in mechanical consistency and the capacity to hold and release oil.

X-ray diffraction has been used to measure orientation. For a given diffraction maximum to be detected, the responsible crystal planes must stand perpendicular to the plane of the incident and diffracted x-rays with their normal bisecting the angle between the two beams. By adjusting the sample so that every plane through it in turn comes to this orientation the distribution of soap crystallites in the samp'e can be determined.

It has been established by means of this technique that the particles in the calcium stearate-cetane-water system are lath-like in shape and that mechanical dispersions (pastes) are more easily oriented than thermal dispersions (gels or greases depending on processing). A more nearly quantitative approach is being developed. It is possible ultimately that varying orientability under controlled conditions may come to provide an objective practical description of grease "texture".

NLGI Annual Meeting Program

MONDAY — OCTOBER 27

MORNING SESSION—10:00 a. m.—Chairman, W. W. Albright

1. *Address of Welcome*—G. E. Merkle, President
2. *Address*—Dr. Neal Bowman, National Association of Manufacturers

AFTERNOON SESSION—2:00 p. m.—Chairman, G. A. Olsen

3. *Roller Bearing Grease Lubricants for Railway Car Journals*—H. T. Rockwell, New York Central System
4. *Lithium—Today and Tomorrow* — H. C. Meyer, Jr., and J. Fentress, Foote Mineral Company
5. *A Continuous Method for the Manufacture of Lithium Grease*—P. J. Baker and N. T. Joyner, The Girdler Corporation

4:00 p. m. ANNUAL BUSINESS MEETING

5:45 p. m. SOCIAL HOUR

6:45 p. m. ANNUAL DINNER

TUESDAY — OCTOBER 28

MORNING SESSION—9:30 a. m.—Chairman, W. W. Albright

6. *Flow of Lubricating Grease Between Parallel Planes*—L. C. Brunstrum and Dr. H. M. Grubb, Standard Oil Company (Indiana)
7. *Additives for Greases*—Dr. R. T. Macdonald and J. L. Dreher, California Research Corporation
8. *Performance of Synthetic Greases*—Dr. E. R. Booser, A. E. Baker and Dr. E. G. Jackson, General Electric Company

AFTERNOON SESSION—2:00 p. m.—Chairman G. E. Merk'e

9. *Preparation and Properties of Silica Aerogel-Thickened Greases* — E. C. Milberger and Miss L. J. Swatik, Standard Oil Company (Ohio)
10. *USAF Grease Development and Lubrication Problems* — B. Rubin and J. C. Mosteller, Wright Air Development Center
11. *N L G I Fellowship Report* — Dr. Marjorie J. Vold, University of Southern California

WEDNESDAY — OCTOBER 29

9:30 a. m. — TECHNICAL COMMITTEE MEETING—Chairman, T. G. Roehner.

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NLGI

—A Short Sketch Of Its History and Organization

When It All Started

No one is exactly certain when the idea of forming an organization to represent the lubricating grease manufacturing industry was founded. The general belief is that it was James McKee who originally transformed the idea into action.

Sometime during 1930, or 1931 at the latest, he began advocating the formation of an industry organization during trips over the country visiting manufacturers while representing his company. Other than laying the ground work, nothing was actually accomplished until the advent of the National Industrial Recovery Act (NRA).

This granddaddy of all emergency legislation put about everybody in the frame of mind of actually forming an industry organization. Probably those feeling the necessity more keenly than others were: J. R. Battenfeld, W. H. Saunders, Jr., and Guy Peters. They met at the Coronado Hotel in St. Louis, Missouri, during the fall of 1932, and decided to call an industry organization meeting.

The First N.L.G.I. Meeting

On June 29, 1933, Temporary Chairman, Martin B. Chittick, opened an organization meeting at the Stevens Hotel in Chicago, Illinois. Thirty-four attended representing twenty-nine companies. W. H. Saunders, Jr., presented a tentative Constitution and By-Laws and J. R. Battenfeld was elected Temporary Chairman and Guy Peters, Temporary Secretary. The next day they met again and accepted a tentative NRA Code.

1933 Objectives Still Good Today

When J. R. Battenfeld was asked at this first meeting to explain the organization's objectives he probably didn't realize at the time that he was clearly defining a pattern that is as good today as it was then.

What he told the group was "to provide some sort of code that the grease makers could operate under . . . IT WOULD ALSO PROVIDE FOR . . . COLLABORATION WITH OTHER SCIENTIFIC ORGANIZATIONS, SUCH AS COMMITTEE D-2 OF THE A.S.T.M. AND THE S.A.E."

"Collaboration with other scientific organizations" since then has been our goal. In a large measure this probably explains the steady growth of the NLGI. At various times in its history expeditions into untried activities have been considered, but never seriously enough to warrant action beyond conversation.

Some Policies and Their History

Contrary to a rather widespread belief, this organization has never embraced any certain group of lubricating grease manufacturers as opposed to another. From its inception both large and small manufacturers have equally belonged and collaborated in solving manufacturing and application problems of interest to all members of this industry.

By 1934 they had started thinking about a permanent organization. Considerable difficulties were encountered in getting under way and developing activities beyond those advocated by NRA. This quotation from a bulletin circulated among the membership at that time typifies their 1934 belief in a sound organization and the effort involved in building it:

> ". . . any trade or industry which thinks that it can squeeze out . . . advantages of industry organization, without going through all the tortuous processes of building up and maintaining a good trade association, is like a raw football team which thinks it can win a big game without training."

Purposes

Since its inception the National Lubricating Grease Institute has consistently changed with the shifting economic scene. To fully describe objectives it has changed names three times. Keeping in step with expanded activities, the Constitution and By-Laws have also been changed four times.

Our Present Purposes as defined by the Constitution:

1. To act as a clearing house for the collection of lawful information pertinent to the manufacture and use of lubricating grease, and to disseminate such information to manufacturers, marketers and consumers of lubricating grease and to the public.

2. To promote the advancement of research and practical tests in the field of lubricating grease manufacture and use.

3. The study of product classifications and methods of tests; their development in cooperation with other technical societies; the publication of such data for the information of manufacturers, marketers, consumers of grease and the public.

4. The collection of lawful technical information.

5. The fostering of such industry policies as will tend to maintain free and open competition among manufacturers and all classes of trade who serve in distributing the products of the industry.

Activities

The purposes outlined in our workable Constitution and By-Laws have been clearly reflected in activities benefiting the public, this industry and NLGI Members.

NLGI activities fall easily into two categories: (a) those carried on by members for industry benefit; and (b) activities held in conjunction, or jointly, with other organizations.

Membership Activities:

Activities carried on by members for industry benefit are diverse and formulated over a long period.

NLGI PENETRATION NUMBERS . . . . By 1938 members were well along their course in developing scientific information. During that year a tentative classification of penetration numbers was introduced. By 1939 they had been carefully considered, adopted and copyrighted.

EMBLEM . . . Another copyrighted item is the distinctive NLGI emblem. From 1933 to 1940 it was considered at various times and finally adopted. A design wasn't difficult to produce, but its use was difficult to establish. Wisely the organization directed its use as an industry insignia, abandoning suggestions that it be used commercially.

ANNUAL MEETING . . . Over most of its history the NLGI has held annual meetings that have always been open to the public. Technical papers are delivered by leading authorities on manufacture or application of lubricating greases. Subjects are also covered by consumers and representatives of organizations collaborating with us. Usually they cover a three day period with one full day devoted to a meeting of the Technical Committee.

MAGAZINE & SPECIAL RELEASES . . . Institute members continually keep themselves informed regarding the latest progress and developments of the lubricating grease manufacturing industry. Their official magazine THE SPOKESMAN is mailed monthly to all members and numerous bulletins as well as special releases are furnished members by the Institute office.

GOVERNMENT DEPARTMENTS . . . Government Departments recognize the N.L.G.I. as a reliable source of scientific information and clearing house for the industry it represents. Contacts are maintained with: the Department of Commerce, Bureau of Standards, War and Navy Departments, Federal Trade Commission and the Interstate Commerce Commission. During times of National emergency we represent membership to Federal Agencies.

FELLOWSHIP . . . The most ambitious and possibly far reaching activity is the NLGI. Fellowship in Colloidal Science granted to the University of Southern California in 1951.

Objectives of this activity are:

1. To elucidate fundamental problems in the structure of colloidal materials which are basic to an understanding of the behavior of lubricating greases.

2. To develop experimental techniques which may be

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useful in relating the observed properties of greases to their physical chemical structure.

3. To stimulate research interest in this field of colloid science, among academic as well as industrial groups.

4. To provide personnel trained in the field of colloid science and aware of the scope available for application of their training to problems of the grease industry.

5. To assist in keeping members of the National Lubricating Grease Institute aware of fundamental developments of potential utility in solving their own practical problems.

Activities Carried on in Conjunction With Other Organizations:

The idea of cooperating with other industries in developing test methods started early in 1934 when Martin B. Chittick wrote to the Anti-Friction Bearing Manufacturers Association. His letter suggested that our organization cooperate with theirs in a study of lubricants for ball and roller bearing applications.

They were also interested in creating a joint project to such an extent that six members of the Bearing Engineers Committee of the AFBMA planned to purchase a newly perfected bearing testing machine in the hope a like number of lubricating grease manufacturers would do likewise. Their idea was for each group to test various greases individually and check results with one another.

If the proposal for cooperative tests was new, so was the idea of doing it with a machine. Checking into the proposal, NLGI's Ernest V. Moncrieff described the machine:

"It is a bearing driven by a small electric motor. The device can be heated with a bunsen burner and tendency to oxidize, aerate or bleed can be studied at different temperatures."

The "device" wasn't immediately successful and BEC adandoned plans to immediately release standard testing procedures to the National Lubricating Grease Institute, American Society for Testing Materials, National Standards Association and the American Society of Mechanical Engineers. Returned for further adjustment, it was in use by the end of 1935.

Also in 1934 another first try at cooperative endeavor got successfully under way. Ralph R. Matthews, Chairman of Sub-Committee 4, Grease, of Committee D2, ASTM was also collaborating with NLGI in a project with the ultimate goal of creating cooperative tests resulting in obtaining the views of both producer and consumer. Those early endeavors have since grown considerably as a part of the Technical Committee activities.

The Institute Spokesman

Our members have always been kept advised regarding their industry progress and developments. From 1933 to 1937 a regular mimeographed bulletin service was furnished them. By that time it was felt that a printed publication could be issued. The Executive Committee met at the Downtown Athletic Club in New York City to outline the new venture.

The President at that time was Homer Wilhelm and the present title of THE INSTITUTE SPOKESMAN has been attributed to him. Following that meeting THE SPOKESMAN was issued monthly as a two-page publication, later growing to four pages and finally eight pages where it remained until 1946 when it was changed from its pamphlet style to a full magazine as it appears today.

Unique in several respects, it is the only known monthly magazine completely devoted to the publication of technical articles regarding the manufacture or application of lubricating greases. Preponderance of technical articles are written by members of this industry and it is largely maintained financially through advertising by Active and Associate Members of the Institute.

Maintained as a non-profit service to this industry, it enjoys a circulation throughout the industrial world in both the United States and bbroad. Subscriptions are open to anyone.

Unusual for a Technical publication is the fact that it has won both National and International awards for journalistic achievements and pleasing appearance.

Possibly the most unusual feature is the fact that it has continuously remained the property of NLGI Members. Two editorial committees entirely determine content material and operating policies. Each is a subcommittee of the Technical Committee. One group is engaged in securing articles for publication. The other passes on them for technical veracity and judges their appropriateness for publication. Through the functioning of these two subcommittees operating independently of each other it has been possible for SPOKESMAN readers to receive the most advanced type of scientific information and confidently believe that experts have passed upon all scientific reading material as being correct and substantiated with proper data.

Technical Committee

During the NRA days of 1933 it was necessary to form a committee establishing standards and specifications for that agency. This group was known as the Standards and Specifications Committee and functioned as such from 1933 to 1938 when it became known as the TECHNICAL COMMITTEE.

From its inception the group has always worked cooperatively with other technical groups starting with a study of lubricants for ball and roller bearing applications with the Bearing Engineers Committee in 1934. During early years it was a rather obscure group with its objectives thinly defined. Early records would indicate that various scientific studies and explorations were assigned the committee in lieu of anything better to do with them. Neither the committee nor its work was very seriously considered, the bulk of the membership believing the single purpose of the NLGI could only be to work with the NRA. Actually this obscure group bridged the gap between early industry thinking and the present NLGI belief that it exists for the purpose of cooperating with other scientific organizations in the development of better methods of testing and producing lubricating greases.

Operation of the entire Technical Committee is directly under the supervision of a Chairman and two Co-Chairmen. Chairmen of the various subcommittees and panels report directly to them. The subject of projects to be undertaken generally are suggested by NLGI membership.

Patents and Developments

Purifying Calcium Soaps of Wax Acids

In the preparation of fatty acids by oxidation of high molecular weight petroleum fractions such as petrolatums, waxes, etc., the crude oxidized mixture is saponified to produce sodium soaps. These soaps still contain nonacidic materials such as aldehydes, ketones and alcohols, and such impurities must be removed in some manner.

In U. S. patent 2,597,844, issued to Cities Service Research and Development Company, it is claimed that the troubles usually encountered in the purification of the calcium soap of such materials can be mostly overcome by mixing the soap with sufficient sand or other inert material to distribute the soap in an even thin film over the surface of the sand at above 180° F., at which temperature the calcium soaps are in a semisolid condition. The thus comminuted particles are extracted in a Soxhlet column with acetone reflux, thereby obtaining a calcium soap in a highly purified form on the surface of the sand.

The wax acids are recovered by treatment with hydrochloric acid.

High Consistency Grease Resistant to Bleeding

A patent issued to Phillips Petroleum Company (U. S. 2,598,154) points out that the prior art shows that considerable difficulty is obtained in producing stable greases from certain combinations of oils and soaps. A breakdown of structure occurs for many combinations of soap when heated in oil and cooled rapidly. The patent recommends rapid cooling of soap-oil mixtures which tends to encourage formation of granular masses in liquid oil. As the first step in the process, it is desirable to encourage, by rapid cooling, the formation of a mass consisting of a hard gel which breaks into lumps or crumbles with or without exudation of much free oil.

This non-grease-like mass is severely milled (worked) to bring it to a grease-like texture. The severe milling produces a result which is claimed to be unexpected and contrary to that of the known art. Instead of producing a grease which continues to soften on extended working, it produces a grease which, during the process of severe working, usually increases in consistency and always tends to reach a degree of consistency that remains substantially constant. These greases so produced are claimed to have only a slight tendency to bleed. By rapid cooling, is meant that the mixture of soap and oil should be cooled to the desired temperature within a period preferably between 10 and 300 seconds.

One application of the process is the production of a grease from a soap-oil mixture which does not dissolve when heated even at a temperature just below that of thermal decomposition, but stratifies into a lower layer of soap with a minor

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proportion of oil and an upper layer of oil containing a minor proportion of soap, which phases cannot be homogenized by mild agitation. On cooling, a dense gel results from the lower layer and a soft gel from the upper layer. On extended milling, the two portions together, a grease of excellent quality as to low loss in consistency is produced, having only a slight tendency to bleed.

In heating the soap-oil mixture, it is only necessary to heat it to a point at which the soap begins to ball up in the oil during the stirring (usually about 365° F.). However, it is not preferred to cool from that point since the mixture is difficult to work. Instead, heating is continued, with stirring, while adding soap to the soap-oil mixture, beyond the point at which balling of the soap takes place and until the entire mixture is liquefied. Rapid cooling may be started at or above saturation temperature. Slow cooling gives a softer grease which has less resistance to change in consistency on extended working and greater bleeding tendency.

By this technique, it is claimed that greases may be prepared which hitherto have not been possible. For example, a smooth grease is obtainable by rapid cooling of solutions of anhydrous barium stearate in high V.I. mineral oil. Likewise with calcium oleate, magnesium stearate and calcium stearate. Sodium soaps were found to give best greases when NaOH is combined with C_{16}-C_{20} fatty acids, while the best lithium soaps were obtained with C_{10}-C_{14} acid (preferably C_{12}).

A diagramatic flowsheet of the process is depicted in Figure 1. Diluent, soap and oil are delivered to the mixing chamber 1 through lines 2, 3 and 4 respectively. The materials are kept in suspension in the mixing chamber. The diluent is a low or medium boiling liquid which may or may not be miscible with the oil. The ratio of diluent to soap-oil combination should be such that on suddenly reduced pressure and evaporation of the solvent, the latent heat of vaporization absorbed by the diluent shall produce the desired cooling effect.

The mixture then is pumped by metering pump 7 into heating section 8 where the mixture is rapidly heated, during agitation, to about 355°-540° F. The mixture changes on heating from a suspension of soap in the oil diluent mixture to a liquid dispersion of soap in the oil-diluent mixture. This liquid is forced through expansion valve 9 into expansion chamber 10 maintained at pressure low enough to insure that practically all of the diluent is flash evaporated, with the result that the soap-oil residue is cooled below the gelling temperature of the soap (say 285° F. or below).

Baffle plate 13 prevents grease from entering the exhaust with the vaporized diluent. The vapors are lead through cooler 14 and thence to condensation chamber 15. Diluent is recycled through line 16 to line 2. The residue of soap and oil is worked severely in grease worker 17 and passed into storage 18 from which it is removed by screw conveyor 21, through filter 22 and delivered into a container filling machine through line 23.

High Temperature Greases

It will be recalled that the Standard Oil Development Company obtained U. S. patent 2,516,137 dealing with the application of the Cannizzaro reaction, such as the reaction with furfural, in connection with grease compositions. A recent patent (2,599,343) points out that furfural type greases made in small laboratory batches have excellent dispersion of the complex thickener but this has been found difficult to duplicate in larger scale manufacture. Another drawback to the process is the fact that temperatures above those obtainable with steam-jacketed kettles have been considered necessary.

The recent patent states that it is possible now to use conventional steam-jacketed vesse's because of a new compounding technique in which the process is supplemented by

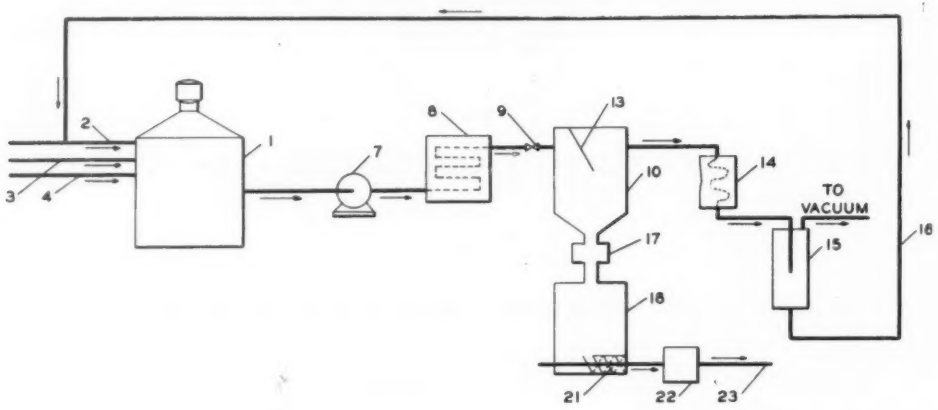

FIG. I

vigorously milling the grease product after cooking has been completed.

In essence, the process involves mixing about 1-5 parts by weight of a saponifiable fatty acid having 12-22 carbon atoms with about 3-10 parts of a mineral base lubricating oil, then adding a strong metal base in excess to saponify the acid. Thereafter, there are added about ¼-2 parts of an aldehyde of molecular weight less than C_{12} fatty acids and capable of undergoing the Cannizzaro reaction in presence of the base to form the corresponding salt in presence of the lubricating oil and saponified acid. The mixture is heated to above 210° F., but not above about 340° F., with mixing, to remove water and evaporate alcohol released in the reaction. Further cooking and blending in additional lubricating oil are resorted to in order to form a grease of the desired consistency.

When viewed through a microscope, greases prepared by carrying out the Cannizzaro reaction first, or prepared by attempting to combine oil containing the salt in suspension with a grease containing soap, are seen to have relatively large brown particles of the salt. These do not adversely affect the general lubricating properties of the grease but they represent a relative waste of thickeners.

GOOD NEWS!

NLGI Wins

Grand Award For

Distinguished Service

Formal Presentation Will Be

Made at the NLGI Annual

Meeting Banquet, October 27.

Edgewater Beach Hotel **Chicago, Illinois**

ATTEND the NLGI Annual Meeting . . . October 27-29

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Minneapolis, Minn. **N. Tonawanda, N. Y.**

GREASE MANUFACTURERS

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RESISTANCE TO OXIDATION
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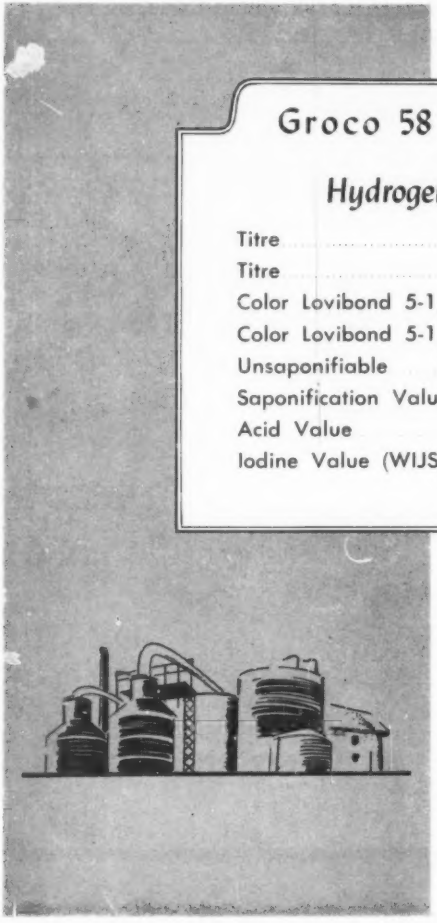
LIGHT COLOR
UNIFORMITY

INSIST ON A. GROSS & Company Fatty Acids*

Write for our free booklet "Fatty Acids in Modern Industry"



Groco 58

Hydrogenated Tallow Fatty Acids

Titre	57.0° C. min.	
Titre	134.6° min.	
Color Lovibond 5-1/4 red	1.0	— 2.0
Color Lovibond 5-1/4 yellow	5	— 15
Unsaponifiable	0.25%	— 0.75%
Saponification Value	202	— 204
Acid Value	201	— 203
Iodine Value (WIJS)	3 max.	—

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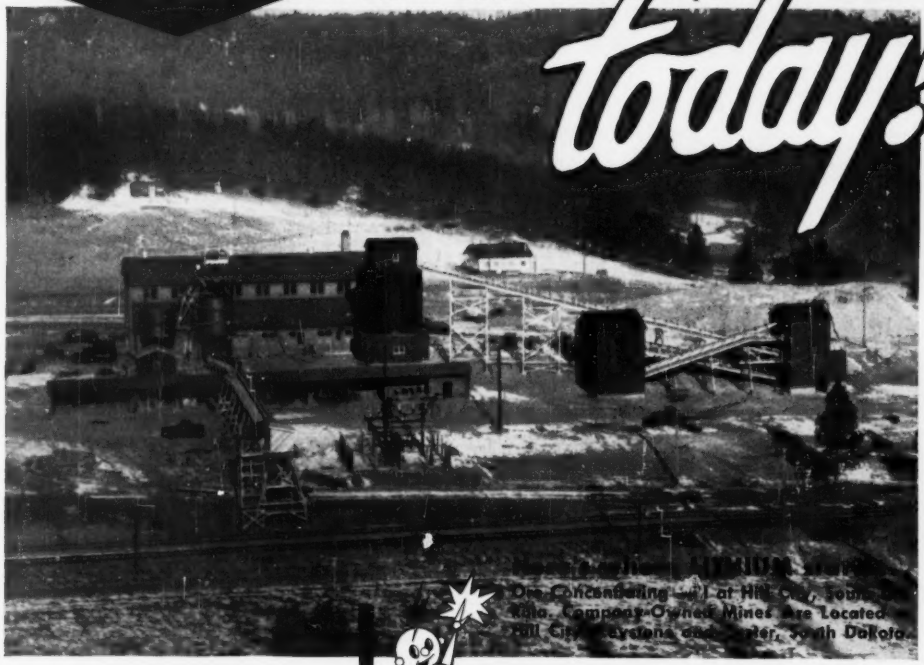
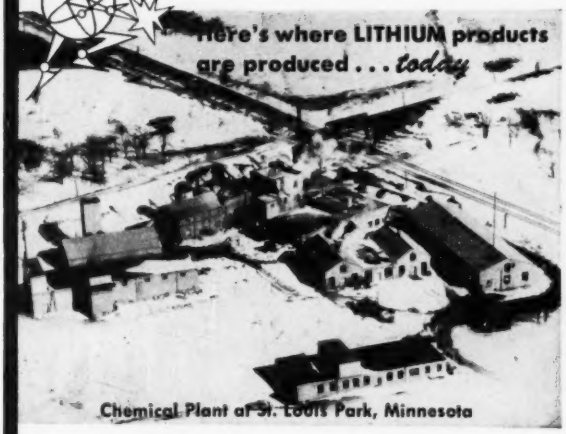
today!



Ore Concentrating Mill at Hill City, South Dakota. Kaolin Company-Owned Mines are Located Near Hill City, Keystone and Custer, South Dakota.

EXPANSION of Lithium production to the point where it will meet demand can only be thought of in terms of . . . *years*. Metalloy is naturally a part of this long-range picture. Our *immediate* objective, however, is coping with today's demands for Lithium . . . *today*. We believe the photographs tell the story. A new $300,000 Flotation Mill started producing in March of this year. It assures an increased supply of raw material, of a better grade. A substantial amount has been invested in auxiliary equipment for mining and transporting ore. A capital investment totaling a quarter of a million dollars has increased the capacity of our Chemical Plant. Additional reserves of ore in the United States and Canada assure us of an adequate source of raw material for many years to come. Research and product development remains a continuing thing.

Write us (Dept. N) for Data Sheets on our Lithium compounds. Reserve supplies of our Lithium products in experimental quantities are available for your research personnel. Ask for them.



Chemical Plant at St. Louis Park, Minnesota

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PEOPLE in the Industry

New Steel Pail Manufacturing Plant in South Is Announced

GORDON D. ZUCK

Gordon D. Zuck, president, announces the organization of Vulcan Steel Container Co., for the manufacture of steel pails in sizes from one to 12 gallons and the establishment of a new, modern plant in Birmingham, Alabama, to serve the needs of the growing industrial South. This new plant was specially built and equipped solely for the manufacture of steel shipping containers for paint, chemical, food and petroleum products and complete warehouse stocks are maintained of all trade sizes. Hi-bake linings which meet the requirements of a wide diversity of food and chemical products are also available.

Mr. Zuck is well-known throughout the steel shipping container industry where he has been closely associated with all phases of manufacture and marketing for the past 19 years. He served on the Steel Shipping Container Industry Advisory Committee of N.P.A. and has been active in a number of national associations devoted to the development of container specifications and their wider application to shipping needs and requirements. Mr. Zuck has traveled extensively in the South and has a wide acquaintance both with the leaders of industry and with the container needs for shipping. With the establishment of a manufacturing plant in Birmingham he will make his permanent home in the South.

Witco Makes Appointments In Reorganization Of Executive Staff

Witco Chemical Company announces that recent reorganization of the executive staff has resulted in the following appointments:

Mr. William Wishnick to the position of assistant to the president, J. J. Tumpeer to national asphalt sales manager, B. W. Lewis to midwest asphalt sales manager, J. A. Raggio to eastern asphalt sales manager, W. F. Twombly in charge of product deve'opment, J. H. Wishnick to manager of Chicago and Lawrenceville plants, Stanley Trimble to controller.

Mr. Thomas J. Starkie is now national chemical sales manager, E. F. Wagner is assistant national chemical sales manager, C. A. Damen is assistant vice-president in charge of the Washington office, M. A. Minnig is national sales manager of rubber chemicals with H. Brubacker as assistant national sales manager of carbon black.

Carl H. Mueller Appointed Director of Engineering

CARL H. MUELLER

Lincoln Engineering Company, St. Louis, Missouri, manufacturers of lubricant application equipment announces the appointment of Carl H. Mueller to the position of director of engineering.

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SUPPLIERS OF MATERIALS FOR MANUFACTURING LUBRICATING GREASES

DARLING'S

STEARIC ACID
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RED OIL
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DARLING & COMPANY Manufacturers
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ALUMINUM STEARATE

MORE THAN 30 YEARS OF
CONSTANTLY IMPROVING
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EXTREME JELL
AND
HIGH JELL GRADES

New, greatly enlarged
modern plant now in
operation

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UNIFORM, DEPENDABLE
Write today for samples, prices and availability
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One who is familiar with control manufacturing and research in Lubricating Greases and Oils. Excellent working conditions in strictly modern up-to-date Laboratory with old established and reputable firm. Write giving full details and resume in first letter. Salary open. Box 588, The Institute Spokesman.

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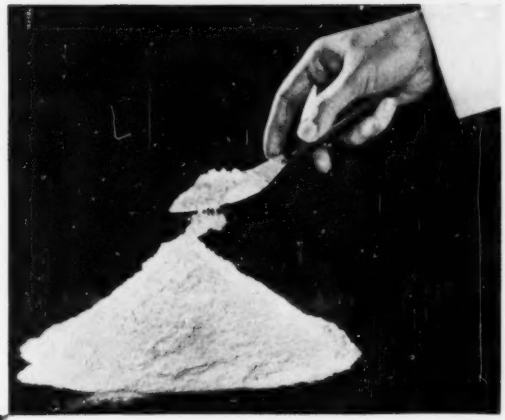
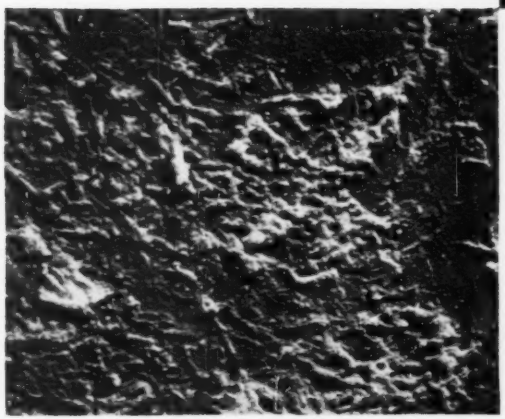
EVERY 1000 MILES

"DON'T TRADE IT...
LUBRICATE IT!"

Purity and Uniformity of
CYANAMID'S
ALUMINUM STEARATES





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GREASE FORMULATIONS

Rigid testing and quality control, thorough structure studies with the latest equipment . . . all help to give Cyanamid's Aluminum Stearates the following advantages for superior lubricating grease formulations:

. . . Superior gelling . . . Excellent stability . . . High resistance to mechanical breakdown

Available in three grades:

Cyanamid Aluminum Stearate G-100
Gives maximum gelling . . . developed for continuous grease-making equipment.

Cyanamid Aluminum Stearate G-200
Higher gelling properties in hydrocarbon oils than a conventional di-stearate . . . gives smooth gel of moderate consistency.

Cyanamid Aluminum Stearate G-300
Gives high yield and excellent stability in a variety of oils . . . for use in conventional grease-making equipment.

write for booklet:
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INDUSTRIAL CHEMICALS DIVISION
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WITCO stearates are especially noted for a high degree of uniformity, freedom from foreign matter, low moisture and low soluble salt content. They produce medium to extremely high gels of excellent stability, smoothness and color, and their superior gelling characteristics tend to make them more economical.

Witco manufactures a complete line of grease-grade stearates, each designed to do a specific job:

WITCO Aluminum Stearate No. 22 . . . medium gel strength. Suitable wherever a definite percentage of soap is required.

WITCO Aluminum Stearate No. 22-H . . . medium-high gel. Excellent economy and performance. Produces smooth, stable greases. Particularly recommended for Gulf Coastal and low viscosity index stocks.

WITCO Aluminum Stearate No. 23 . . . medium-high gel. Excellent economy. All around good performance in a variety of oil stocks.

WITCO Aluminum Stearate No. 22-C . . . very high gel. Outstanding performance in Pennsylvania base and high viscosity index stocks.

WITCO Aluminum Stearate No. 22-G . . . extremely high gel. Produces greases of excellent stability with minimum tendency to bleed. Excellent color and clarity.

WITCO Lithium Stearate . . . forms clear, light-colored greases with excellent water resistance. Operating temperatures from −90°F to 400°F. 6% to 8% soap ample for multipurpose greases.

WITCO Lithium Hydroxystearate . . . good water resistance and high stability over a wide temperature range. Excellent non-corrosive properties. Well suited for synthetic greases.

Write for technical service reports.

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Industry NEWS

NLGI Will Receive Award At Annual Meeting Banquet

The National Lubricating Grease Institute has just won the highest honor that can be presented any organization representing industry.

This honor is the American Trade Association Executives 1952 Grand Award for Distinguished Service. It is given each year to the trade association considered by a Jury of Awards to have:

> "Rendered outstanding service to the industry which it represents as well as the American public."

The Jury of Awards, selecting NLGI as the outstanding trade association of the year, was headed by Secretary of Commerce Charles Sawyer. Other members of the Jury were: William J. Grede, president, National Association of Manufacturers; Dechard A. Hulcy, president, Chamber of Commerce of the United States; Edward H. Stromberg, Northwestern University; and Dr. Ray B. Westerfield, Yale University.

N L G I EXECUTIVE SECRETARY Harry F. Bennetts, left, receives the Grand Award for the Institute from Don. C. Bliss, United States Minister to Canada. The presentation was made at the A. T. A. E. annual meeting in Toronto, Canada.

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PETROSULS
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Dependably uniform from order to order, Penn-Drake Petrosuls are high quality petroleum sulfonates. In addition to supplying regular products, we will work with you in developing for your specific needs, special sulfonates of calcium, barium and other metals.

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Branches: Cleveland, Ohio and Edgewater, N.J.

Chek-Chart Announces Lubrication Training Program

Week by week, the conviction is growing that TRAINING is a certain solution to the service station's most vexing problem — shortage of help. Newspapers and magazines of the trade stress the lack of "know-how" in new, inexperienced help . . . cite instance after instance where profits are pirated by inexperience. That the problem is acute is amply substantiated by the recent publication of the API's manual, "Developing Your Men Builds Profits", an outline on training methods prepared under the direction of the Division of Marketing by the Marketing Personnel Training Committee. It includes a comprehensive outline for training in correct and complete lubrication.

To meet the need for a more comprehensive lubrication program as indicated by industry and trade paper spokesmen, The Chek-Chart Corporation, Chicago, recently published a new series of training booklets entitled, "The How and Why of Automotive Lubrication."

These booklets are designed to provide service station trainees with a fundamental knowledge of passenger car lubrication techniques. Six, eight-page sections, totaling 48 pages, cover every phase of automotive lubrication from body hardware through power steering. Included too, are complete instructions on automatic transmission service. Important service points and procedures indicated in the text are supplemented by more than 130 "how-to-do-it" illustrations.

Chek-Chart engineering writers have outlined each point or procedure in an easily understood, step-by-step style ideally suited for not only service station beginners, but seasoned service men as well. Not only does this new training program show a trainee "how to," but also explains *why* certain procedures are necessary at different locations. This not only helps the trainee understand what he is doing, but gives him a fund of customer-convincing sales points.

"How and Why" booklets are available singly or may be obtained as a complete set. Complete sets may be obtained as a single, covered booklet or in six separate sections, punched for insertion in loose-leaf notebooks.

25 Members Named To an API Subcommittee

The membership of the Jobber Advisory Subcommittee set up in May by the American Petroleum Institute has been announced by Harry J. Kennedy, API vice-president for the Division of Marketing.

The subcommittee will consist of 25 members and two legal counsellors, Mr. Kennedy reported. He said:

"A smaller group was desired by all concerned, but it was soon apparent that, to pay due regard to the democratic process, no small group could supply a reasonable, adequate cross-section of oil marketers, both geographically and functionally.

"Even a membership of 25 doesn't take care of every individual interest, but it was concluded that we had to keep this subcommittee below a size that would make it unwieldy and defeat its purpose."

R. M. Bartlett of Gulf Oil Corp., Pittsburgh, Pa., was appointed chairman of the subcommittee. Other members are:

Charles H. Arnold, Haggert's Service, Inc., Fargo, N. D.; E. K. Bennett, E. K. Bennett Oil Co., Longview, Tex.; Dwight F. Benton, Standard Oil Co. (Indiana), Chicago, Ill.; John F. Cummins, Cumberland Oil Co., Nashville, Tenn.; Horace E. Davenport, Geo. W. Pickering Co., Salem, Mass.; M. D. De Tar, Aero Oil Co., New Oxford, Pa.; James E. Dyer, Sinclair Oil Corp., New York, N. Y.; John Harper, Harper Oil Co., Long Island City, N. Y.; Walter Hochuli, The Texas Co., New York, N. Y.; A. M. Hughes, Phillips Petroleum Co., Bartlesville, Okla.; R. J. Hull, Cities Service Petroleum Co., New York, N. Y.; J. G. Jordan, Shell Oil Co., New York, N. Y.; Robert A. Kent, Kent Oil Co., Salina, Kans.; Jess Knowles, Skelly Oil Co., Kansas City, Mo.; E. F. McCabe, Tidewater Associated Oil Co., New York, N. Y.; R. W. McDowell, Mid-Continent Petroleum Corp., Tulsa, Okla.; Miles Mills, Oils Inc., Des Moines, Iowa; M. H. Robineau, Frontier Refining Co., Denver, Colo.; George L. Savory Oil Co., Inc., Binghamton, N. Y.; Roy Thompson, Apex Motor Fuel Co., Chicago, Ill.; L. E. Ulrope, Esso Standard Oil Co., New York, N. Y.; J. L. Wait, Continental Oil Co., Houston, Tex.; John H. White, Hewitt Oil Co., Charleston, S. C.; and Russel S. Williams, Gasteria, Inc., Indianapolis, Ind. Legal counsellors: Oscar John Dorwin, The Texas Co., New York, N. Y., and Otis Ellis, National Oil Jobbers Council, Washington, D. C.

Mr. Kennedy, who is marketing vice-president for Continental Oil Co., commented that "the whole industry is asked to keep in mind that this advisory group must confine its deliberations and recommended actions within the specific limitations provided in the enabling resolution that was passed without a dissenting vote at the Boston meeting. This body will be incompetent to act on anything else, but still within such limits it can, without doubt, constructively and properly service the jobber segment of the industry to a point that will abundantly satisfy the strong call that caused its creation."

NO POURING PROBLEMS with G.P.&F. SHIPPING CONTAINERS

Headquarters for quality steel containers! That's G. P. & F.! Wide variety of types and sizes ranging from 2 to 7 gallons: Standard Lug-Cover Pails; Pouring Pails; Dome-Top Utility Cans; Flaring Pails; Double Compartment Pails; E-Z-Fill Grease Gun Loader Pails; Galvanized Half-Bushel Baskets; Pouring Drums. Your choice of solid colors or lithographed designs. Special coatings, if desired. Whatever your shipping and pouring problems are, consult G. P. & F.

POURING SPOUTS FOR EVERY NEED!

PULL OUT SPOUT

Sturdy, tinplate construction. Closed into 45 mm. nozzle opening. Spout diameter: 1 1/8". Available with U-Pressit cap and seal, or screw cap and innerseal. Can be ordered on lug-covered pour pails and tight head drums.

FLEXSPOUT

Non-toxic polythene resin spout . . . closed into 2 1/8" nozzle opening. Plastic diaphragm and resealing cap. Tamper-proof seal can be lithographed in your design. Spout is closed in on lug-covered pails . . . shipped loose on tight head drums.

SHORE SPOUT

Self-venting . . . fast, smooth-pouring. No need to puncture air holes in container. Made of seamless, extruded aluminum . . . inserted in tinplate retainer. Fits in 73 mm. nozzle opening. Available with U-Pressit or screw-type caps.

TRUPOUR SPOUT

A strong, telescopic tinplate spout . . . closed into 55 mm. nozzle opening. Available with U-Pressit cap and seal, or screw cap and innerseal. Can be ordered on lug-covered pails and tight head drums.

All spouts shown above are available on lug-covered pails and tight head drums.

DOUBLE-POURING CAP and FLEXIBLE HOSE SPOUT

Available only on G. P. & F. Dome-Type Utility Cans. Seamless, tapered pouring spout closed into dome of can. Double cap provides 1 1/4" and 3/4" pouring openings. Innerseals available. Detachable, 8" galvanized flexible hose spout available for clean, easy pouring into hard-to-get-at places. Screws into 3/4" opening. Handy storage clip fits over spout.

GEUDER, PAESCHKE & FREY CO.

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The Boston resolution was as follows:

"It is moved that the chairman of the A.P.I. Division of Marketing appoint a subcommittee on jobber problems to engage in the following activities to the extent that it is legal to do so;

1. Promote the compilation of statistics and making of factual studies which would be useful to jobbers in the solving of their own problems, excluding, however, studies involving future supply and demand relations.

2. To seek to encourage a better understanding by jobbers and suppliers of each others problems.

3. Promote the preparation and distribution of technical articles and talks which would be interesting and of assistance to jobbers.

4. Consider the making of public opinion surveys which might be useful to jobbers.

5. This subcommittee under no circumstances should recommend plans or programs or engage in any discussion of prices, margins, commissions, allowances, sales territories, form or provisions of contracts, adequacy of profits or marketing policies, or the supply arrangements for any jobber or group of jobbers, or make agreements whatsoever in relations thereto, or take any action which may be violative of any law.

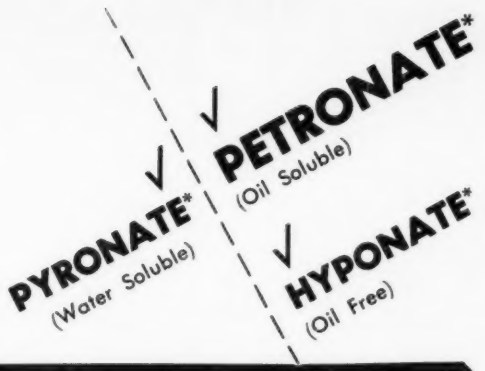
To insure the legal property of the activities of this subcommittee, the subcommittee membership should include at least one attorney who shall be in attendance at all meetings."

Pacific Automotive Show Announcements Mailed

Invitational mailings to the Automotive Industry announcing the Fifth Annual Pacific Automotive Show to be held at the CIVIC AUDITORIUM, SAN FRANCISCO, CALIF., February 26, 27, 28, and March 1, 1953, have been completed.

According to President Fred Aurel, the response—with applications for Exhibit Space—has far exceeded expectations.

This Show is of great interest to the Wholesalers of the eleven Western States, who have supported and participated in the PACIFIC AUTOMOTIVE SHOW since its beginning and who will wish to be a part of this great Show and enjoy the prestige of sponsorship in the months prior to its presentation.



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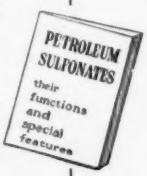
Sonneborn petroleum sulfonates — superior in quality and possessing exceptional uniformity — are now made to fit a wide variety of specific needs. They can also be tailor-made to your exact specifications. You can rely on prompt shipment.

* Reg. U. S. Pat. Off.



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This valuable booklet gives highly useful data on the many ways PETROLEUM SULFONATES are being and can be used. Write today for this highly informative booklet.

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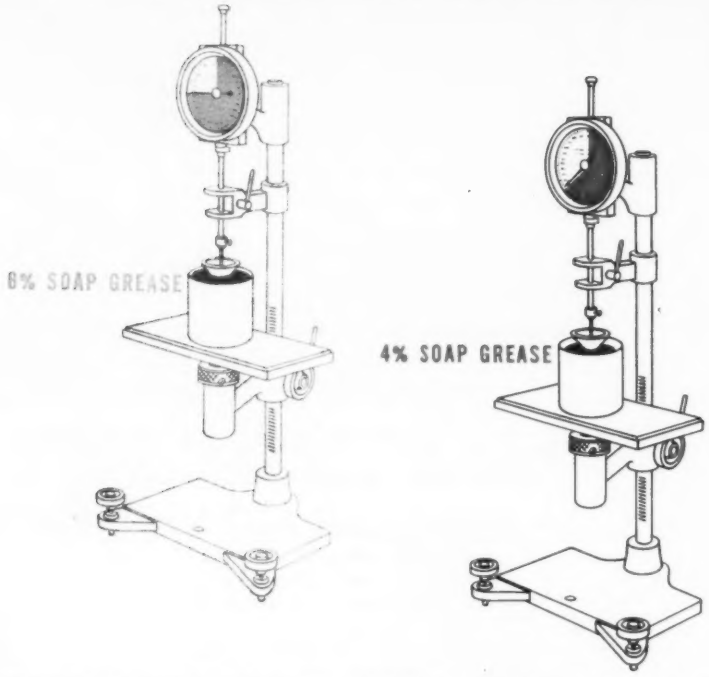

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Today's grease market is putting a real squeeze on many grease-makers' profit margins.

That's why the new Warwick aluminum stearates, giving higher yield with less stearate, are so welcome now.

Here's a new opportunity to save dollars and cents . . . and get at the same time all the important properties both grease-maker and grease user are looking for today.

Get the complete story direct . . . also samples on request. Simply write, wire or phone.

WARWICK
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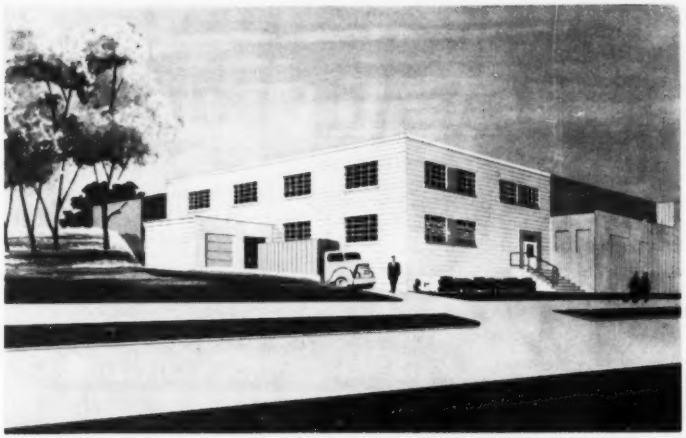
10th STREET and 44th AVENUE, LONG ISLAND CITY, NEW YORK

Warwick's complete line of stearates includes: Aluminum, Calcium, Cadmium, Manganese, Magnesium, Lead, Zinc (USP), Zinc (Tech), Cobalt, Barium, Iron

Work Begins on Battenfeld's New Building



BATTENFELD'S proposed laboratory and material handling building.

Construction has started on a new laboratory and material handling building for the Battenfeld Grease & Oil Corporation of Kansas City, according to A. J. Daniel, president of the corporation.

The two-story concrete and steel building will be immediately south of the present plant. The entire second floor of the new building will be devoted to new laboratory facilities, including the present research laboratory, grease control laboratory, and offices and a conference room. All new laboratory equipment is being installed in the new structure.

The unloading dock for the material handling section will be large enough to accommodate two large trailer trucks. This means that the raw materials will then be unloaded at the head of the production line enabling the materials to move more smoothly and efficiently over a streamlined production system through the plant to the shipping dock.

The new building was necessitated by the increasing work load in the laboratories and the Battenfeld policy of staying ahead in quality production. It is expected that the building will be ready for use this fall.

IPE Seeks More Space For 1953 Exhibits

The International Petroleum Exposition management is seeking the second additional space section to take care of the unprecedented demand for exhibit facilities at the 1953 oil show at Tulsa, Wm. B. Way, general manager, has announced. The first additional space section secured n July has been sold out.

"Requests and inquiries indicate that between 150 and 250 more oil equipment and service firms will contract for space at the May 14-23, 1953, show than have exhibited at any previous exposition," Mr. Way said.

"There were 574 contracts for space at the last show, held in 1948, which represented more than 1000 companies.

"A total of 628 space contracts have already been signed for the 1953 show."

The housing committee, headed by Barton A. Myers, reports that over 750 houses, ranging from two to five bedrooms, have been listed for rent during the show and that oil companies are now leasing these.

Those wishing houses or hotel rooms should contact the IPE Housing Bureau, 616 South Boston, Tulsa.

Rent forms, with an insurance provision, are available through the Housing Bureau, Mr. Myers said.

The exposition has purchased for rental to exhibitors and has stored over $50,000 worth of chrome and leather furniture.

Sewer, water and electric lines have been completed in the first new exhibit

(*Continued on Page* 39)

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Automotive Lubricants — Greases and Cutting Oils —

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15 WEST 51ST. ST., NEW YORK 19, N.Y.

Plymouth

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Still Preferred for:

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- VERSATILITY

Also Some New

EXTREME HIGH GEL GRADES

M. W. PARSONS-PLYMOUTH, Inc.

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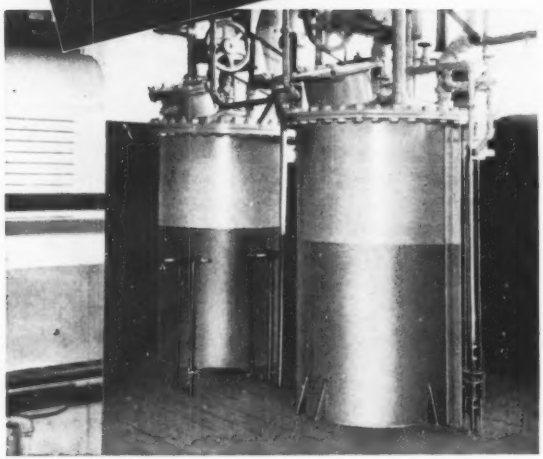
Votator GREASE MAKING APPARATUS

speeds production

by eliminating pan-cooling



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(*Continued from Page* 37)

space section obtained for the 1953 show.

Two-thirds of the work of the $100,000 renovation and repair program for the IPE grounds is now complete, Mr. Way reports.

"The exposition management is doing all in its power to provide all the exhibit space needed and we hope those unable to obtain space thus far will bear with us until we can create suitable space," Mr. Way said.

Small Refiners Advised To Manufacture Jet Fuels By Experts at NPA Meeting

Fuel supplies for jet planes are adequate at the present time, but small refiners can contribute much to the nation's defense effort—and help themselves at the same time—by turning more and more to the production of jet fuels.

That was the consensus of a group of experts at a jet fuel symposium recently at the National Petroleum Association's Golden Anniversary meeting at the Traymore Hotel.

The small refiners were told that they can handle the manufacture of jet fuels without difficulty, because it does not require the extensive and expensive equipment needed to blend and process high-octane aviation gasoline.

In addition to increasing the fuel supplies, the small refiners also were advised that they can help the distribution problem through the diversity of their geographical locations.

This will have far-reaching implications in the event of an all-out emergency, the experts agreed. Both government and industry members of the panel concurred that jet fuel needs for peacetime commercial aviation will require only a fraction of available oil supplies over the next decade.

OIIC of API Releases Movie, '2 Equals 3'

The story that couldn't come true—but did—is told vividly in a new motion picture produced by the Oil Industry Information Committee of the American Petroleum Institute.

Entitled "2 Equals 3," the motion picture takes its audience behind the closed doors of a laboratory where it is shown how two gallons of modern gasoline will do the work which required three gallons in 1925.

The demonstration is conducted by Dr. Roy K. Marshall, distinguished scientist, author and television personality.

In terms everyone can understand, Dr. Marshall explains how an automobile engine works and how greater pick-up, power and all-around performance, are built into modern motor fuels.

He uses simple laboratory devices and actual working models to demonstrate how modern gasoline makes an automobile purr instead of ping, go farther faster and do more work at no extra cost.

Dr. Marshall's casual, friendly presentation in much the same manner that has won him considerable fame in television, is expected to make the motion picture ideal for audiences of all ages, whether they drive trucks, cars or tractors, or are simply curious about scientific progress.

Running time for the motion picture is 14 minutes. In black and white only, prints may be obtained through the Oil Industry Information Committee, 50 West 50th Street, New York 20, at $25.00 for 16-millimeter, and $60.00 for 35-millimeter.

T. F. Patton Predicts Curb of Labor Power

A prediction that the next session of Congress will enact legislation to "curb the power of Labor" was made recently by Thomas F. Patton, vice-president and general counsel of Republic Steel Corporation, Cleveland.

Mr. Patton, in a five-point address before the Golden Anniversary meeting of the National Petroleum Association in Hotel Traymore, also excoriated President Truman and the federal government for what he termed a "shoulder-to-shoulder alliance" with labor in the recent steel strike.

He asserted that if the steel companies and the steel union had been able to carry on their negotiations without government interference, "much of the loss brought about by the steel strike would have been avoided."

He urged industry to be as aggressive as labor in pressing for new legislation. But he warned:

"This legislation must not deprive labor of any of its just powers, but it must take away the excess."

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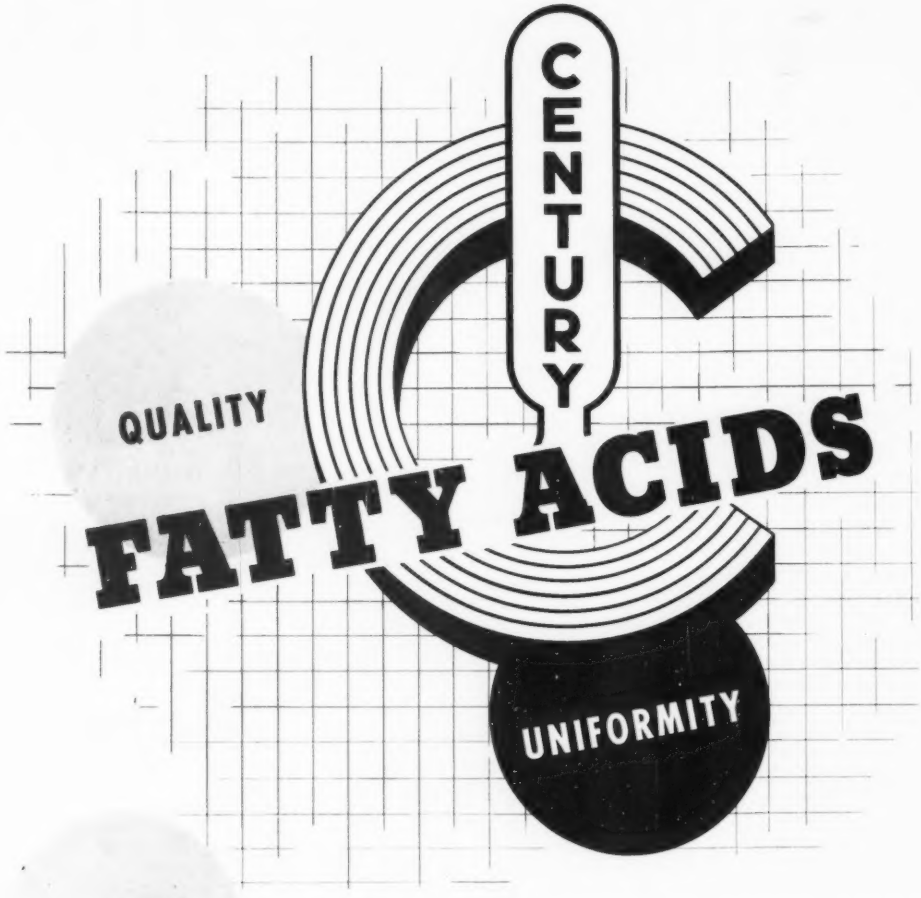

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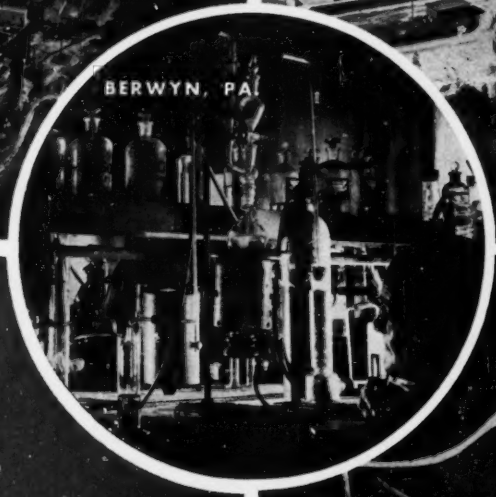

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FUTURE MEETINGS of The Industry

20-21 South Dakota Independent Oil Men's Assn., Alex Johnson Hotel, Rapid City, S. D.

20-22 American Oil Chemists' Socy. (fall meeting), Netherland Plaza Hotel, Cincinnati, Ohio.

20-24 National Safety Council (40th national safety congress and exposition), Conrad Hilton Hotel, Chicago, Ill.

22-24 Socy. of Automotive Engineers (national transportation meeting), Hotel William Penn, Pittsburgh, Pa.

23-24 American Inst. of Mining and Metallurgical Engineers (petroleum branch — West Coast fall meeting), Statler Hotel, Los Angeles, Calif.

26-28 Pennsylvania Petroleum Assn. (7th annual meeting), Pocono Manor Inn, Pocono Manor, Pa.

27-29 National Lubricating Grease Institute (20th annual meeting), Edgewater Beach Hotel, Chicago, Ill.

27-30 American Petroleum Institute (Division of Refining, Committee on Analytical Research), The Rice, Houston, Tex.

29 Oil Trades Assn. of New York, Inc., Waldorf-Astoria, New York, N. Y.

30 American Socy. for Testing Materials (St. Louis District), St. Louis, Mo.

30-31 Socy. of Automotive Engineers (national diesel engine meeting), Chase Hotel, St. Louis, Mo.

30 to Nov. 1 Rocky Mountain Oil and Gas Assn. (annual meeting), Cosmopolitan Hotel, Denever, Colo.

NOVEMBER, 1952

4-5 Nebraska Petroleum Marketers, Inc. (annual convention), Hotel Paxton, Omaha, Neb.

6-7 Socy. of Automotive Engineers (national fuels and lubricants meeting), Mayo Hotel, Tulsa, Okla.

8-13 Oil Industry Information Committee, Conrad Hilton Hotel, Chicago, Ill.

10-13 American Petroleum Institute (32nd annual meeting), Conrad Hilton Hotel and Palmer House, Chicago, Ill.

11-12 American Petroleum Institute (Board of Directors meeting), Conrad Hilton Hotel, Chicago, Ill.

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13 American Petroleum Institute (Executive Committee meeting), Conrad Hilton Hotel, Chicago, Ill.

17-18 Oil Industry TBA Group (annual meeting), The Park Plaza and Chase Hotels, St. Louis, Mo.

Week of Nov. 17 American Socy. for Testing Materials (Southern California District), Los Angeles, Calif.

19 American Standards Association (34th annual meeting), Waldorf-Astoria, New York, N. Y.

25 American Socy. for Testing Materials (E-11 on Quality Control of Materials), Philadelphia, Pa.

25 American Socy. for Testing Materials (Northern California District), San Francisco, Calif.

30 to Dec. 5 American Socy. of Mechanical Engineers (annual meeting), Statler Hotel, New York, N. Y.

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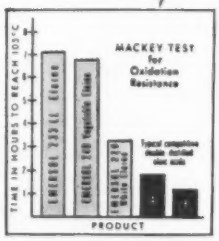
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